

**UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

Precision Conversions LLC

for an exemption from §§ 25.783(h),
25.807(g)(1), 25.807(i)(1), 25.810(a)(1),
25.812(e), 25.812(h), 25.813(b),
25.857(e), 25.1445(a)(2) and
25.1447(c)(1) of Title 14, Code of Federal
Regulations

Regulatory Docket No. FAA-2003-16288

PARTIAL GRANT OF EXEMPTION

By letter dated October 6, 2003, Mr. William J. Wagner, Vice President of Engineering, Precision Conversions LLC, 613 West Valley Parkway, Suite 220, Escondido, California, 92025, petitioned the Federal Aviation Administration for an exemption from the following sections of Title 14, Code of Federal Regulations (14 CFR):

§§ 25.783(h), 25.807(g)(1) and (i)(1), 25.810(a)(1), 25.812(e) and (h),
25.813(b), 25.857(e), 25.1445(a)(2), and 25.1447(c)(1).

The requested exemption, if granted, would permit relief from the requirements of these regulations to allow carriage of four non-crewmembers (commonly referred to as supernumeraries) on Boeing Model 757-200 airplanes which have been converted a from passenger to freighter configuration.

The petitioner requests relief from the following regulations:

Section 25.783(h), Amendment 25-88, requires that each passenger entry door in the side of a fuselage must meet the applicable requirements of §§ 25.807 through 25.813 for a Type II or larger passenger emergency exit.

Section 25.785(j), Amendment 25-88, requires, in pertinent part, that there be a firm handhold to enable occupants to steady themselves when moving through the aisles in moderately rough air.

Section 25.807(g)(1), Amendment 25-94, requires that, if overwing exits are not provided, airplanes having a passenger seating configuration of 1 to 9 seats must be fitted with an emergency exit having at least the dimensions of a Type III exit in each side of the fuselage.

Section 25.807(i)(1), Amendment 25-94, requires that airplanes having a passenger seating configuration of 1 to 9 seats must have at least one exit above the waterline in each side of the airplane, meeting at least the dimensions of a Type IV exit.

Section 25.810(a)(1), Amendment 25-88, requires that each non-overwing emergency exit more than 6 feet from the ground have an approved means to assist occupants in descending to the ground. For passenger exits, this must be a self-supporting, automatically deployed and erected slide at each applicable exit.

Section 25.812(e), Amendment 25-88, requires floor proximity emergency egress lighting in passenger areas; and § 25.812(h) requires that each passenger exit for which assist means is required must include a means to illuminate the expected evacuee alighting zone.

Section 25.813(b), Amendment 25-88, requires that each emergency exit addressed by § 25.810(a) have adjacent assist space.

Section 25.857(e), Amendment 25-93, limits Class E cargo compartments to all-cargo airplanes.

Section 25.1445(a)(2), Amendment 25-00, requires, when crew and passengers share a common oxygen supply source, means to separately reserve the minimum supply required by the flightcrew on duty.

Section 25.1447(c)(1), Amendment 25-87, requires that oxygen masks must be immediately available to each seated occupant and must be automatically deployed with manual backup.

Related sections of the regulations:

Section 121.583(a) contains, in pertinent part, a listing of categories of people who may be carried aboard an airplane in part 121 service without complying with all the requirements of part 121 for passenger-carrying airplanes.

The petitioner supports its request with the following information:

“Introduction

“Precision Conversions LLC (Precision) is converting Boeing Model 757-200 Series Passenger airplanes into Freighters under FAA Project ST4018SE-T. Part of the conversion involves adding a double-occupant seat identical to the standard Flight Attendant seat already certified on the B757-200 passenger airplane. This will change the flightdeck occupancy from a maximum of four persons to a maximum of six persons. As the Freighter modification removes most of the passenger carriage and egress capabilities of the airplane, exemption from certain regulations regarding these capabilities must be sought in order to preserve both the economic advantages of the freighter configuration and the essential safety provisions for the airplane occupants.

“This petition recognizes and acknowledges that in order to maximize the economic benefit of the airplane as a freighter, it will be necessary to remove the existing passenger service doors from service. To accomplish aircraft entry and exit during normal and emergency operation, a new "crew entry door" will be added to the left hand side of the airplane at BS 317.5 measuring 22 inches wide by 48 inches high. This door is similar in size and location to the emergency/service door installed in the Boeing 757-200 Package Freighter (B757-200PF). Further, like the B757-200PF, this door will have an 8.4-inch step up from floor level and will not contain a slide provision for emergency egress, but will utilize inertia reels.

“The flight deck windows will also be retained as emergency exits, and the First Officer's window will be modified to allow for exterior opening by emergency rescue personnel.

“This petition is presented for exemption from the following sections of CFR 14 Part 25, as appropriate to the conversion of these airplanes into dedicated side cargo door freighters.

- “- §25.783(h)
- “- §25.807(g)(1) and (i)(1)
- “- §25.810(a)(1)
- “- §25.812(e) and (h)
- “- §25.813(b)
- “- §25.857(e)
- “- §25.1445(a)(2)
- “- §25.1447(c)(1)”

"Information to Support Grant of Exemption

- "1. The Freighter airplane will be equipped with a solid 9g cargo barrier installed at Body Station (BS) 345.5, which is forward of the existing 1 Left and 1 Right passenger doors. This removes the possibility of using these existing doors for service or emergency egress. The new crew entry door is therefore required, but due to space and structural limitations, a Type II door flush at floor level is not possible. However, per the revisions of Part 121.583 covering the passengers that may be carried on this airplane, all passengers will have special training covering proper methods for egress from the airplane. Further, the limited number of personnel that may be carried on the flight deck and the availability of the existing flight deck windows for egress insure adequate levels of safety for the flight deck occupants.
- "2. The flight deck of the Precision Conversions B757-200 Freighter (B757-200PCF) is equipped with openable No. 2 left and right flight deck windows previously certified as flight crew emergency exits. The right hand window will be modified to add capability to be opened from outside the airplane, and its means of opening will be marked on the right hand exterior airplane fuselage. The ropes / lanyards installed at the windows will be retained as the emergency egress assist means for these exits.
- "3. The airplanes will be modified to include an exterior light on the left hand side of the lower forward fuselage. The left hand light is identical to the emergency exit light used for the emergency exit door of the B757-200PF.
- "4. The occupancy of the Precision B757-200PCF is limited to a total of 6 persons, four of whom may be "supernumerary" occupants as defined by § 121.583(a)(1) through (a)(7). Limitations will be imposed on the aircraft operator to find that all occupants are physically able to use the escape means provided. Enclosure 2 to this letter shows the occupied area of the airplane in relation to the available exits, the inertia reel descent devices, and the rigid 9g barrier.
- "5. In the small spaces of the occupied portions of the airplane, the crew will easily be able to provide any instructions or assistance needed by the supernumerary occupants. Additionally there are no flight attendants who would normally utilize the required assist space. Therefore the lack of assist space adjacent to the emergency exits will not lower the level of safety in an emergency egress situation.
- "6. It is the intent to allow the operator to use the supernumerary capability of the airplane to ferry up to four non-crew occupants. When supernumeraries are carried, they will be briefed prior to each flight as to the location and use of the emergency egress assist means and procedures.

- "7. The oxygen system on the Precision B757-200PCF will be similar to the previously certified B757-200PF system, and will serve the two flight crewmembers and the four non-operating occupants. The system has a demonstrated capacity sufficient to meet or exceed the requirements defined by §25.1439(b)(5), §121.329(b)(1), and §121.333(b) for all six occupants.
- "8. All occupants in the Precision B757-200PCF flight deck will have available the same quick-donning flight crew-type oxygen masks, which are not automatically presented. The location of the supernumeraries with the flight crew, and their high level of training, will allow the crew to easily command non-operating occupants to don the masks, and verify their proper usage. This provides a level of benefit commensurate with that generally expected from automatic mask presentation, the use of which in the Precision B757-200PCF flight deck will not enhance safety beyond that obtained by manual, quick-donning flight crew type masks.
- “The lavatory will also be outfitted with a portable walk around oxygen bottle equipped with a manual, quick-donning flight crew type mask. This area will not be utilized for takeoff or landing.
- "9. Evacuation of all occupants through a flight deck window was demonstrated as described in a Boeing Aircraft letter, dated January 14, 1987, to the FAA Seattle Aircraft Certification Office (ACO). The demonstration showed 2 women and 5 men of age 29 to 52 years and of varying physical stature able to evacuate the flight deck through a window assisted by a rope in 73 seconds. By comparison, the Precision B757-200PCF will have a maximum occupancy of six persons.
- "10. The flight deck window evacuation procedure, specifically a recommended body-positioning sequence, will be added to the Airplane Flight Manual Supplement of the airplane. Procedures for use of the inertia descent devices and harnesses will also be included in the AFMS, and will be posted near the new crew entry door, as well.

“Additional Supporting Information - Emergency Egress:

“The Precision Freighter conversion includes deactivation of all existing passenger doors and the addition of a new left side crew entry door. The crew entry door will be used both as a service door and as an emergency exit. The Precision B757-200PCF left-side crew entry door is designed for use with a rigid cargo barrier and cannot support operation with a cargo barrier net. Reconfiguring the proposed Precision B757-200PCF interior to accommodate the original passenger entry door fitted with an escape slide, using either a rigid barrier or a cargo net, for emergency use would necessitate reducing the airplane's cargo-carrying capability, thereby imposing a significant economic hardship on Precision and airplane operators.

“The existing flight deck window exits and the new crew entry door are all above the waterline of the airplane in a ditching situation.

“It is Precision's position that the combined presence of the crew entry door and the two window exits, all equipped with assist means appropriate to their use, provides a level of safety for this airplane and its intended use that is equivalent to that provided for other airplanes and/or uses meeting the provisions of 25.807(g)(1) and (i)(1).

“Additional Supporting Information - Egress Assist Means:

“In Exemption 4808A for the B757-200 Package Freighter, the FAA concurred that safe evacuation of 2 crewmembers and 5 non-crewmembers could be effected using the exits and egress means provided aboard that airplane, which included one door of Type II size equipped with inertia descent devices, and one internally-operable window and one window operable both internally and externally, both equipped with ropes.

“The Precision Freighter will similarly be equipped with inertia descent devices as assist means at the crew entry door, which is a Type II door. Inertia reel descent devices at exit doors have been shown to be as safe and effective as automatically erected slides for evacuating small numbers of occupants. Demonstrations and actual emergencies in which slides have been used to rapidly evacuate airplanes typically have resulted in injuries to the evacuees. The use of reels with a small number of occupants has the potential to mitigate injury during evacuation. Also, the use of reels, or reels plus harnesses, is a simple, intuitively obvious process, is not strenuous, and does not require specific positioning or movements by the evacuees.

“The right-hand cockpit window will be modified to be externally operable, and the ropes/lanyards at both windows retained. The proximity of the ropes installed at the flight deck windows to the flight crew, who will be able to insure proper use by all occupants, provides a significant offsetting consideration in lieu of automatically erected means.

“Precision will include a flight deck evacuation procedure in the Airplane Flight Manual Supplement for the use of ropes / lanyards when exiting the airplane through the flight deck windows. The Supplement will also include the requirements for the specific techniques for emergency egress to be briefed to non-crew occupants before each flight.

“Additionally, the Operations Manual will include limitations upon the Operator to find that all occupants are physically able to use the egress assist means provided.

“Additional Supporting Information - Emergency Egress Lighting & Signage:

“The entry area emergency exit signage includes downward directed illumination of the floor at the crew entry door. Emergency egress path marking lights will not be installed, as the proximity of the occupants to the flight deck windows and the crew entry door provides a level of safety that would not be enhanced for 6 persons by installation of floor proximity emergency egress lighting.

“All signage, lights, and placards indicating other exits will be removed or permanently modified to delete such indication.

“Additional Supporting Information - Emergency Exterior Lighting:

“The external light installed on the lower portion of the forward fuselage will illuminate the expected evacuee alighting zone under the crew entry door in compliance to §25.812(h)(1) in all landing cases except those involving nose gear collapse. The zone under the left hand window will likewise be illuminated, but the zone under the left hand window will not be fully illuminated in the landing case of a right hand main deck gear collapse not accompanied with wing deflection. This emergency exterior lighting configuration is similar to the previously certified B757-200PF configuration.

“The following table shows the attitude and illumination conditions resulting from gear failures:

Condition		Final Attitude	Illumination (approx. % Area) vs Sill Height (in.)			
No.	L. Gear Loss	Nose-	Entry Door		LH Window	
1	none	Level	100	164.4	100	174.5
2	Nose	Down	100	70.1	30	74.7
3	LH & RH	Up	100	155.4	100	168.7
4	LH	Up	100	244.7	100	261.1
5	RH	Up	100	264.6	80	280.5
6	LH	Up	100	230.6	100	246.7
7	RH	Up	100	253.3	100	268.9
8	Nose & LH	Down	20	51.7	0	57.3
9	Nose & RH	Down	70	82.6	20	88.2

“Notes:

- "1. Cases 3, 6, & 7 were analyzed assuming deflection of the wing and gear structures upon which the airplane finally comes to rest.
- "2. Cases 8 & 9 involve loss of the engine/nacelle on the lost LG side of the airplane. Airplane comes to rest on remaining main gear, opposite wing, and fwd fuselage.

"3. Failure of all gear with no loss of the engines/nacelles would result in the same final attitude as that of case 3, which was analyzed assuming engines/nacelles stay intact.

"14 CFR 25.810(a)(1) requires emergency egress assist means for those exits more than six feet (72 inches) above the ground with the airplane in normal ground attitude, and 14 CFR 25.812(h)(1) requires ground illumination for those exits. Although an airplane with failed landing gear will not come to rest in normal ground attitude, the data is compared to these requirements as a conservative approach.

"The table shows the illumination of the alighting area under the door exit meets the requirement of 14 CFR 25.812(h)(1) in seven of the nine cases listed. In case 8 the door sill height is below the minimum height for which assist means is required by 25.810, and ground lighting is therefore not required by 25.812. In case 9, the outboard 70% of the alighting area is illuminated to the requirement. Thus in all gear failure cases but one, the assist and lighting requirements are met, and in the single noncompliant case the portion of the alighting zone which is most visible from the door will be illuminated at or above the level indicated in the requirements.

"A case involving the loss of all gear and both nacelles was not analyzed, as it is intuitively obvious that the lights would not be effective, but all exit sills would be lower than the minimum height for which ground illumination is required.

"Additional Supporting Information - Oxygen System and Capacity

"For purposes of evaluation of the reserve oxygen available with a common system for passenger and crew, all six occupants were considered to be crew.

"The minimal undiluted oxygen supply to the flight deck is sufficient for all six crew members during emergency descent in response to a rapid depressurization; or in a detection event, for smoke detection, descent phases, and 30 minutes of depressurized flight at 25,000 feet cabin altitude for the purpose of fire suppression.

"In comparison, the B757-200PF has been certified with a 110 cubic foot gaseous oxygen capacity, which provides sufficient oxygen for the above described situations for seven occupants. The Precision B757-200PCF will use a similar oxygen system as the B757-200PF, retaining the same 110 cubic foot oxygen capacity, for only six persons.

"Each oxygen dispensing outlet to be used in the flight deck includes shutoff capability. The proximity of the non-operating occupants to the flight crew will allow the pilot and/or first officer to command shutoff of these outlets. Incorporation of additional capability to shut off the oxygen flow to non-operating

occupants in order to preserve supplies for the operating crew would not enhance safety aboard the Precision B757-200PCF beyond that afforded by the current system in use on B757-200PF.

“The portable oxygen bottle used in the lavatory utilizes a separate oxygen canister, and is not part of the gaseous system that serves the flight deck. Therefore, use of this system will not affect the crew oxygen capacity.

“Additional Supporting Information - Instructions to Occupants:

“The Airplane Flight Manual Supplement (AFMS) will require the crew to brief non-operating occupants on the safe use of the provided escape means prior to each flight.

“Additionally, the limitation to a total occupancy of six persons, who meet the requirements of §121.583(a)(1) through (a)(7), and who must have demonstrated the physical capability to use the provided means of escape will be included in the AFMS. The Operations Manual will contain illustrated sequences showing the recommended evacuation procedures for emergency egress through either the window exits or crew entry door using an inertia reel and harness, which will be required to be briefed to all non-crew occupants prior to each flight.

“Evaluation of Public Interest:

“The presence of trained personnel when live or hazardous cargoes are carried aboard the aircraft will preserve proper flight safety, and is therefore in the public interest.

“The cargo carrying capacity allowed by the inclusion of the rigid 9g barrier forward of the existing door 1 left and right constitutes a legitimate public interest for shipping customers, aircraft operators, and Precision. The grant of this exemption will improve the utility of the airplane for the operator by ensuring needed cargo management personnel will be available in flight and at each flight destination. These capabilities will improve cargo carrying efficiency and will tend to reduce overall airfreight rates, as competitive pricing structures among freight operators will be promoted; the public interest is served by lower freight rates and competitive pricing.

“As these and other B757-200 Passenger airplanes are moved into cargo service, operators will replace them with airplanes meeting newer safety requirements, which will tend to elevate safety levels across operating fleets. An overall elevation of safety is in the public interest.

“Petition for Exemption

“In consideration of the foregoing discussion, Precision Conversions LLC petitions for exemption from the following portions of 14 CFR Part 25 for B757-200 Passenger airplanes converted to Freighters by FAA Project ST4018SE-T:

“§25.783(h), Amendment 25-88, as the emergency exit door lower sill is 8.4 inches above the floor level;

“§25.807(g)(1), Amendment 25-94, as the airplane does not have a right hand door that can be used in the event of a 9g landing;

“§25.807(i)(1), Amendment 25-94, as the airplane will not include a Type IV exit in both sides of the fuselage that is above the ditching waterline;

“§25.810(a)(1), Amendment 25-88, as the crew entry door will not incorporate a self supporting, automatically deployed and erected slide usable in an emergency landing event, and is being replaced with inertia descent devices;

“§25.812(e), Amendment 25-88, as the flight deck configuration cannot accommodate floor proximity emergency escape path marking, and the proximity of occupant seating to the emergency exits allows for a degree of safety that would not be enhanced by path marking;

“§25.812(h)(1), Amendment 25-88, as not all portions of the evacuee alighting zones have been shown to be illuminated per the requirements in cases of nose gear collapse;

“§25.813(b), Amendment 25-88, as only one door will be available in a 9g landing, and the existing configuration does not allow for assist space near the emergency exits;

“§25.857(e), Amendment 25-93, as two persons in addition to the type certified flight deck crew may be carried to assist in cargo movement at the flight destination;

“§25.1445(a)(2), Amendment 25-00, as all gaseous supplementary oxygen is to be provided through the flight crew system, which has been demonstrated to meet or exceed flight crew oxygen requirements while providing oxygen to the four other occupants, and includes standard individual outlet shutoff capability; and

“§25.1447(c)(1), Amendment 25-87, as quick-donning flight crew type masks will be utilized at all seats certified for takeoff and landing. These

seats are on the flight deck, affording direct command and oversight of all occupants by the flight crew.

“Precision respectfully requests the FAA's consideration of the foregoing petition. Additionally, we ask that coordination necessary to obtain FAA concurrence and advisement for this petition be performed by the FAA Seattle ACO.

“Request for Waiver of Publication

“Precision believes that good cause exists to waive the publication and comment requirements of §§ 11.85, 11.87, and 11.89. In particular, we feel that the intent of this petition, the reasons presented, and the relief requested are identical to those of exemptions previously granted by the FAA.

“No new design feature is introduced and the reasons presented for exemption are similar to those for which an exemption has been previously granted. (See Exemption Numbers 4808/4808A, 7469, and 8077.) Therefore, this request will not set a precedent.

“Accordingly, Precision requests a waiver for the publication and comment period, so that operators of Precision B757-200PCF airplanes can return to revenue operations without delay.”

A notice including a summary of this petition was published in the Federal Register on December 9, 2003 (68 FR 68686). No comments were received in response to the notice.

The FAA's analysis/summary is as follows:

The certification regulations for transport category airplanes address airplane occupants as being either “crew” or “passengers.” Due to differences in training, physical capabilities, and other factors (such as familiarity with the airplane), the means required by part 25 to address emergency evacuation and emergency equipment differ for passengers and crewmembers.

Because supernumeraries are not crewmembers, they must be considered “passengers” by default, with respect to part 25. However, supernumeraries do hold a special status because of their training and other factors. The FAA, therefore, has granted certain exemptions to allow the carriage of supernumeraries on cargo airplanes without compliance with all of the part 25 standards for passengers, provided that certain other conditions are met. Those conditions have varied, depending on the airplane design, the nature of the proposals under consideration, and the number and location of persons to be carried.

The intent of § 25.783(h) is to ensure that the door used to enter an airplane can also be used as an emergency exit and that the door meets the requirements of § 25.807 through § 25.813. A new left-hand door will be used as the entry door

for the special freighters. It will meet the size requirement of a Type II exit, but not be at floor-level, i.e., it will have an 8.4-inch step-up inside the airplane. Because this exit would be used by a small number of trained supernumeraries in an emergency evacuation, the FAA finds that an 8.4-inch step-up is acceptable for this exemption.

The emergency exit provided on the right side of the airplane—the right flight deck window—does not meet the minimum size for a Type III exit as required by § 25.807(g)(1). The Boeing Company has tested the usability of such a right flightdeck window. Results indicate that the window can be used for an exit—with the evacuation means provided—for a maximum of seven people in the flightdeck of the Boeing Model 757-200PF. Also, the four non-crewmembers of the airplane will have a higher level of training and be physically more capable of evacuating the airplane by using the smaller exit opening provided on the right side of the airplane than would typical passengers.

The emergency exit provided on the right side of the airplane—the right flight deck window—also does not meet the minimum size for a Type IV exit as required by § 25.807(i)(1) for a ditching exit. As discussed above, the utility of the right flightdeck window and its usability with the evacuation means provided has been demonstrated for a maximum occupancy of seven persons on the flight deck of the Boeing Model 757-200PF. This demonstration would also apply to evacuating the airplane for ditching. Furthermore, the four non-crewmembers of the airplane will have a higher level of training and be physically more capable of evacuating the airplane by using the reduced exit opening on the right side of the airplane than would typical passengers. It should be noted that, if life-rafts must be installed for flights over water, they must be of a design that can be launched out the right flightdeck window.

As stated above, because of their training and physical capabilities as well as other factors, flight crewmembers are different than typical passengers, and, as such, the means required by part 25 to enable flight crewmembers to reach the ground are different from those required for passengers. As an example, ropes are allowed as the sole means of escape for flight crewmembers, but slides or equivalent means are required for passengers.

Although supernumeraries must be considered “passengers” by default (because they are not crewmembers) under part 25, the FAA recognizes that supernumeraries normally have unique training to perform their roles on an airplane. As indicated above, the FAA has previously granted exemptions to allow the carriage of supernumeraries on cargo airplanes without complying with all of the part 25 requirements applicable to passengers.

The issue of whether an escape rope or inertia reels with harnesses for trained supernumeraries provide an acceptable alternative to the escape slides required by part 25 for passengers is discussed in some length in Exemption Nos. 4808 and

4808A. (The FAA granted those exemptions to the Boeing Commercial Airplane Group in 1987 and 1997, respectively.) In addition, the issue of whether inertia reels and harnesses provide an acceptable alternative to the escape slide is discussed in detail in Exemption No. 5993A, which the FAA granted in 1995 to the Boeing Commercial Airplane Group for Boeing Model 767-300PF airplanes.

The FAA recognizes that supernumeraries, as opposed to passengers, may be selected and trained appropriately in the use of escape ropes and inertia reels and harnesses. The FAA considers that the petitioner's proposed installation of inertia reels and harnesses at the entry door and an escape rope at the right flightdeck window provides an adequate level of safety to supernumeraries for the petitioner's airplane configuration.

The intent of § 25.812(e) is to provide floor proximity emergency escape path marking in the passenger areas of the airplane. The configuration of the converted Boeing Model 757-200 will not provide such marking, as required by § 25.812(e). However, both of the exits are close to the supernumeraries, and supernumeraries have a higher level of training and knowledge of the airplane configuration than does the typical passenger. The FAA finds that the configuration provides an acceptable level of safety.

The petitioner indicates that illumination of at least 0.03 foot-candles is provided for the entry door exit and left flightdeck window exit at locations where an evacuee would first contact the ground when using the assist means with the landing gear extended. However, the petitioner indicates that some gear collapse conditions exist where illumination of at least 0.03 foot-candles is not provided at all of the locations where an evacuee would first contact the ground when using these exits. Part 25 requires that for passenger exits which are required to have an assist means, there must be consideration of gear collapse conditions. However, consideration of gear collapse conditions is not required for flightcrew exits which are required to have an assist means.

The FAA considers that adequate ground illumination should be provided for exits used by trained supernumeraries, but finds that some deviation from the 0.03 foot-candle illumination criterion for each gear collapse condition is acceptable. The FAA has reviewed the data submitted in the petition and finds that adequate ground illumination is provided for the entry door exit and left flightdeck window exit. However, the pre-flight briefing must instruct supernumeraries to inspect the ground to determine whether a safe landing can be achieved before using the assist means.

The petitioner has not indicated that ground illumination will be provided for the right flightdeck window exit. This exit is required for supernumerary use, and hence, adequate ground illumination must be provided where evacuees would first contact the ground when using its assist means.

With respect to the lack of an assist space adjacent to each exit as required by § 25.813(b), the FAA has determined that the four non-crewmembers will have a higher level of training than would a typical passenger, and will, therefore, have less need for crew assistance. Additionally, in the relatively small confines of the flightdeck, the flightcrew can easily provide instructions and some physical assistance to non-crewmembers, if needed.

The petitioner has requested relief primarily from the requirements of § 25.857(e), which permit carriage of cargo only when a Class E cargo compartment is installed on the airplane. Class E cargo compartments are usually remote from the flightdeck and encompass the entire interior of the airplane. The means of controlling fires that might occur in the cargo compartment is to starve the fire of oxygen. This is accomplished by depressurizing the airplane and maintaining an altitude that will not support combustion. For this reason, passengers are not permitted on board such airplanes. The four supernumeraries will be located in the flightdeck directly behind the flightcrew seats. The FAA has previously granted exemptions for carriage of persons in addition to crew on freighter airplanes, provided that certain other conditions are met. These conditions have varied, depending on the airplane design and the number of persons involved.

In all cases, there must be suitable means of preventing smoke penetration into areas that are occupied. The petitioner's design accounts for this by providing a barrier which must comply with the smoke penetration requirements for the flight deck. However, the petitioner has indicated that configurations may be approved that will allow supernumeraries to enter the Class E cargo compartment and hence open the smoke barrier. In order to provide an appropriate level of safety, the petitioner must install a placard indicating that the smoke barrier is to be secured (i.e., the door or curtain must be closed) when there are no occupants in the Class E cargo compartment; the placard must be located in a conspicuous place either on or next to the smoke barrier.

If access into the Class E cargo compartment is allowed, an aural or visual annunciation, which is operated by the flightcrew and which would be recognized in the Class E cargo compartment, must be installed to indicate that persons must return to their seats and secure the smoke barrier (i.e., close the door or curtain) during a fire in the Class E cargo compartment. Appropriate procedures and limitations would need to be established to ensure that the flightcrew signals the supernumeraries to return to their seats and secure the smoke barrier at the onset of a fire. The pre-flight briefing would need to explain this annunciation to the supernumeraries.

Due to the way that fire in the cargo compartment is to be controlled, it is necessary to limit persons on board the airplane to those who have been found physically fit by the operator and have been briefed on the use of emergency equipment. This limitation on the occupants is consistent with previous approvals and will be included in this approval.

The petitioner has requested relief from the requirements of § 25.1445(a)(2) which require that when a single source of oxygen is provided for the flightcrew and passengers, a means must be provided to separately reserve the minimum supply required by the flightcrew on duty. The petitioner has proposed a design of the system that is intended to provide oxygen to four supernumeraries and the flightcrew, as if they were all required flight crewmembers. Supplying all six occupants as if they were all flightcrew on duty in the flightdeck would comply with the regulations and, thus, would not require an exemption. However, the amount of oxygen must be sufficient for operational requirements for the airplane mission.

Advisory Circular 120-42A, “Extended Range Operation with Two-Engine Airplanes (ETOPS)” provides guidance material for the fire protection requirements. For Class E cargo compartments, the fire protection means is depressurized flight at 25,000 feet cabin altitude. This altitude would need to be maintained for the maximum diversion time for the airplane mission and would, therefore, require sufficient oxygen for that condition. Therefore, 30 minutes of depressurized flight at 25,000 feet cabin altitude for the purpose of fire suppression may not comply with the operational requirements of the airplane or the airplane mission.

The FAA finds that supernumeraries should have a supplemental oxygen system that is comparable to that of passengers. However, taking into account the extra knowledge and training that supernumeraries will have, the FAA does not find that an equivalent system needs to be provided. The petitioner has proposed to provide quick-donning, flightcrew-type oxygen masks, which are connected to the flightcrew oxygen system and are not automatically presented, for the four supernumeraries and to provide a portable oxygen bottle with a quick-donning, flightcrew-type oxygen mask in the lavatory. Section 25.1447(c)(1) requires that oxygen be “immediately available” to each seated occupant. Hence, the oxygen masks at the seats for the supernumeraries must be within reach of the supernumeraries while seated, and the mask must be connected to the oxygen bottle in the lavatory. The petitioner indicated that configurations may be approved that will allow the supernumeraries to enter the Class E cargo compartment to tend to animals or hazardous cargo. In order to provide an acceptable level of safety to the “immediately available” requirement of § 25.1447(c)(1), each supernumerary must carry on his or her person a portable oxygen bottle with a mask connected to it while in the Class E cargo compartment.

Section 25.1447(c)(1) also requires automatic presentation of the oxygen dispensing units. For seated passengers in typical passenger airplanes, the automatic presentation of masks throughout the cabin indicates the need to don an oxygen mask. When the supernumeraries are in their flightdeck seating area, they are close to the flightcrew, and the donning of oxygen masks by the flightcrew

would be an indication for the supernumeraries to don their own oxygen masks. However, supernumeraries in the Class E cargo compartment or lavatory will not have this indication. To provide an acceptable level of safety, an automatically activated aural decompression signal must be immediately recognizable throughout accessible areas in the Class E cargo compartment and in the lavatory. Operation of this signal must be automatic with flightcrew manual action as a backup. A typical lavatory oxygen system which automatically presents a mask to a lavatory occupant is an acceptable alternative to an aural signal in the lavatory.

Configurations may be approved for carrying cargo which would not require supernumeraries to access the Class E cargo compartment. For these configurations, an aural decompression signal is not required to be recognizable in the Class E compartment, if an Airplane Flight Manual limitation is established to prohibit supernumeraries from being in the Class E cargo compartment during flight.

Supernumeraries must be trained about the location and use of the oxygen equipment and the signals for its use. Additionally, the oxygen units must be sized adequately for continuous and uninterrupted use during worst-case flight duration following a decompression.

Although not mentioned by the petitioner, § 25.785(j) requires handholds to enable passengers to steady themselves when moving about the cabin, in the event of moderate turbulence. If supernumeraries are not restricted from entering the Class E cargo compartment, this compartment must be considered in regard to this requirement since persons may move about in it. The FAA recognizes that it would be impractical to require handholds in the Class E cargo compartment. We find that an acceptable level of safety for justifying an exemption will be provided without handholds, if a flightcrew-operated aural or visual annunciation in the Class E compartment indicates at the onset of turbulence that persons must return to their seats. This annunciation is not required, if an Airplane Flight Manual limitation is established to prohibit supernumeraries from being in the Class E cargo compartment during flight.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest and will not affect the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, Precision Conversions LLC is hereby granted a partial exemption, as explained below, from the following sections of 14 CFR:

Section	Amendment Level
§ 25.783(h)	Amendment 25-88
§ 25.785(j)	Amendment 25-88

§ 25.807(g)(1)	Amendment 25-94
§ 25.807(i)(1)	Amendment 25-94
§ 25.810(a)(1)	Amendment 25-88
§ 25.812(e), (h)	Amendment 25-88
§ 25.813(b)	Amendment 25-88
§ 25.857(e)	Amendment 25-93
§ 25.1447(c)(1)	Amendment 25-87

The exemption from these regulations allows the carriage of up to four supernumeraries, in addition to two crewmembers, in the flight compartment of Boeing Model 757-200 airplanes converted from a passenger version to a freighter under FAA Project ST4018SE-T. The following limitations apply and limitations 1 through 3 and 5 through 9 must be documented in the limitations section of the Airplane Flight Manual (AFM):

1. Supernumerary occupancy in the flightdeck is restricted to a maximum of four persons. These occupants are limited to the categories specified in § 121.583(a)(1) through (a)(7).
2. Each supernumerary must be briefed by a flight crewmember on the use of the exits, including instruction to inspect the ground to determine whether a safe landing can be achieved before using an assist means, and emergency equipment prior to each flight.
3. The operator must determine that each supernumerary is physically able to accomplish the necessary emergency procedures.
4. The oxygen masks at the seats for the supernumeraries must be within easy reach of the supernumeraries while seated. Oxygen masks must be connected to any supplemental oxygen bottles.
5. Each supernumerary must be provided with a portable oxygen unit with a mask attached to it that he or she carries whenever he or she is in the Class E cargo compartment. The portable oxygen units may be located in a common area. The supernumeraries must be trained in the use of these oxygen units.
6. An automatically activated aural decompression signal must be present and immediately recognizable in the lavatory and in accessible areas of the Class E cargo compartment to notify supernumeraries when to don oxygen masks. However, no signal is required in the lavatory, if an automatically-presented oxygen mask is installed in the lavatory. No signal is required in accessible areas in the Class E cargo compartment, if an Airplane Flight Manual limitation is established which prohibits supernumeraries from being in the Class E cargo compartment during flight. The pre-flight briefing must include training in the

sound of the signal, the meaning of the signal, and the response to the signal (i.e., procedures for donning the masks and activating the flow of oxygen).

7. A flightcrew operated aural or visual annunciation which is recognized in accessible areas in the Class E cargo compartment must be installed to indicate, during turbulence, that persons must return to their seats. Appropriate procedures and limitations must be established to ensure that the flightcrew signals the supernumeraries to return to their seats at the onset of turbulence and prior to landing. The pre-flight briefing must explain this annunciation to the supernumeraries. This briefing, annunciation, and the associated procedures and limitations are not required, if an Airplane Flight Manual limitation is established to prohibit supernumeraries in the Class E cargo compartment during flight.
8. A flightcrew operated aural or visual annunciation which is recognized in the Class E cargo compartment must be installed to indicate during a fire in the Class E cargo compartment that persons must return to their seats and to ensure that the smoke barrier is secured (i.e., the door or curtain is closed). Appropriate procedures and limitations must be established to ensure that the flightcrew signals the supernumeraries to return to their seats and secure the smoke barrier at the onset of a fire. The pre-flight briefing must explain this annunciation to the supernumeraries. This briefing, annunciation and the associated procedures and limitations to signal the supernumeraries are not required, if an Airplane Flight Manual limitation is established to prohibit supernumeraries in the Class E cargo compartment during flight.
9. A placard must indicate that the smoke barrier must be secured (i.e., the door or curtain must be closed) when the Class E cargo compartment is not occupied. The placard must be located in a conspicuous place in the flightdeck either on or next to the smoke barrier. The pre-flight briefing must inform supernumeraries of this requirement and whether or not they may enter the Class E cargo compartment.
10. For the exits designated for supernumerary use, emergency lighting must provide adequate illumination at the ground end of the assist means where an evacuee would normally make first contact with the ground, with the airplane in each of the attitudes corresponding to the collapse of one or more legs of the landing gear.

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/s/

Kalene C. Yanamura
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service

